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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20040317

Application Number: 09/934,878
Filing Date: August 22, 2001
Appellant(s): GUO ET AL.

Shao-Hua Guo
For Appellant

Supplemental
EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/26/03.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1, 3-11 and 14-18 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,475,073	Guo	12-1995
6,127,500	Guo et al.	10-2000
Aldrich Catalog, Aldrich Chemical Company,		1992-1993

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-11 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guo {US Pat. 5,475,073}, in view of Guo et al. {US Pat. 6,127,500} and further view of Aldrich (Catalog Handbook of Fine Chemicals, Aldrich Chemical Company, 1992-1993).

Appellants claim a process for making an acrylic polyol, said process being performed essentially in the absence of styrene, methyl acrylate and methyl methacrylate, and comprising:

(a) initially charging a reactor with an allylic alcohol, 0-50% of the total amount to be used of a C_2-C_{20} alkyl or aryl acrylate or methacrylate monomer and 0-100% of the total amount to be used of a free-radical initiator;

(b) heating the reactor contents to100-250^0 C or to reflux; and

(c) gradually adding to the reactor the remaining acrylic monomer and initator; wherein the allylic alcohol has the general structure: CH_2=CHR-CH_2-$(A)_n$-OH in which R is hydrogen, a C_1-C_{10} alkyl, or a C_6-C_{12} aryl group; A is an oxyalkylene group; and n, which is an average number of oxyalkylene groups, is within the range of 1 to about 5; and wherein the process gives a total monomer conversion greater than about 90%.

Guo teaches a process for making an acrylic polyol, comprising copolymerizing an allylic alcohol or propoxylated allylic alcohol with a C_1 to C_{20} alkyl or aryl acrylate or methacrylate monomer in the presence of a free-radical initiator (Col. 3, lines 53-60). Guo teaches that the reaction temperature of their process is generally from about 60^0 C to about 300^0 C (Col. 4, lines 40-45) and all or some of the acrylic monomer(s) and initiator of the Guo process are gradually added during the course of the reaction (see Col. 3, lines 61-67; Col. 4, lines 27-31 and Example 3). Guo teaches that the preferred allylic alcohols used in his invention are, inter-alia, mono- or di-propoxylated allylic alcohols of the general formula, CH_2=CR-CH_2-$(A)_n$-OH (R is Hydrogen or C_1-C_5 alkyl; A is an oxypropylene group and n is less than or equal to 2) (Col. 2, lines 32-47). Guo teaches that the acrylic polyol prepared, in Example 3, has a number average molecular weight of 1560 and a weight average molecular weight of 4800, which constitutes a molecular weight distribution of 3.07. Guo's acrylic polyol of Example 3 has a hydroxyl number of 120 mg KOH/g. The difference between the presently claimed invention and what is taught in the Guo reference is that the Guo reference is silent with regard to, (1) heating the reactor contents to reflux, (2) the free-radical initiator containing less than 30 weight percent of water, (3) total monomer conversion of greater than 90%, and (4)

acrylic polyol(s) having a molecular weight distribution less than about 2.5. However, since the Guo teaches a process for preparing acrylic polyols from reacting allyl alcohols or propoxylated allylic alcohols with acrylic monomers, under reaction conditions which anticipate or encompass the presently claimed reaction conditions (e.g., broad reaction temperature range up to 300^0 C, type and amount of monomer used, type of initiator, etc.), it would be reasonable for one having ordinary skill in the art to expect that the heating of the reactor contents to reflux, obtaining a total monomer conversion of greater that 90% and producing acrylic polyol(s) having a molecular weight distribution less than about 2.5 would be realized from Guo's invention (generally taught process for preparing acrylic polyols). Additionally, di-tertiary-butylperoxide is used as the free-radical initiator in Example 3 of Guo's invention. Di-tertiary-butylperoxide (98% solution) is a commercially available solution that contains less that 30% of water (Aldrich, pp. 237).

Guo et al. (US Pat. 6,127,500) teach that the acrylic polyol resins prepared in the US Pat. 5,475,073, cited above, have low molecular weights and molecular weight distributions less than 3. Guo et al. teach that the said acrylic polyol resins disclosed in US Pat. 5,475,073 are valuable reactive intermediates for making high-performance coatings and other thermoset polymers (see Col. 1, lines 41-57 of 6,127,500 patent).

It would have been *prima facie* obvious to one having ordinary skill in the art, in view of the Guo and Guo et al. references, to prepare acrylic polyols as presently claimed because Guo teaches a process for preparing acrylic polyols from reacting allyl alcohols or propoxylated allylic alcohol and acrylic monomers in the presence of a free-

radical initiator, wherein the acrylic monomers used are C_1 to C_{20} alkyl or aryl acrylate or methacrylate monomers, heating the reactants at from about 60^0 C to 300^0 C before gradually adding to the reaction mixture the remaining acrylic monomer and initator.

One having ordinary skill in the art would have been motivated, in view of the teachings in the Guo (US pat. 5,475,073) and Guo et al. (US Pat. 6,127,500) references, to prepare acrylic polyols as presently claimed because one having ordinary skill in the art would have been motivated to optimized the reaction conditions of the Guo process to affect optimum monomer conversion so as to afford an optimum yield of acrylic polyol product. The skill artisan, desiring to prepare acrylic polyol resins that are valuble intermediates for making high-performance coatings and other thermoset polymers, would have also been motivated to vary the reaction parameters of the Guo process so as to afford other art recognizable acrylic polyol resins having low molecular weights and molecular weight distributions less that 3. The instantly claimed invention would have been therefore obvious to one having ordinary skill in the art.

Consideration of Affidavit/exhibit

The copy of the affidavit/exhibit (one "Principles of Polymerization" by Geroge Odian, pages 250-251), submitted on 3/24/04, has not been entered and has not been considered by the Examiner because the submission of the said affidavit/exhibit does not comply with the provisions of 37 CFR 1.195 in that Appellants have not provided a showing of good and sufficient reasons as to why the evidence of the said affidavit/exhibit was not presented earlier.

Response to Arguments

Appellants' arguments have been fully considered but they are not persuasive.

Appellants argue that the Guo or Guo et al. or the Aldrich references or any combination thereof do not teach or suggest (1) a process that is conducted essentially in the absence of styrene, methyl acrylate and methyl methacrylate, (2) a process which achieves a total monomer conversion of greater than 90% and/or a process that uses allyl alkoxylate but not allyl alcohol.

This argument is not convincing because even though Guo does not exemplify a process for making an acrylic polyol, which is conducted essentially in the absence of styrene, methyl acrylate and methyl methacrylate, Guo generally teaches a process for making an acrylic polyol, comprising copolymerizing an allylic alcohol or propoxylated allylic alcohol with a C_1 to C_{20} alkyl or aryl acrylate or methacrylate monomer in the presence of a free-radical initiator (Col. 3, lines 53-60). Guo teaches that the C_1-C_{20} alkyl acrylate or methacrylate monomer used in his invention can be, inter-alia, ethyl acrylate, butyl acrylate, butyl methacrylate and the like (Col. 3, lines 3-8). Guo expressly teaches that the preferred allylic alcohols used in his invention are, inter-alia, mono- or di-propoxylated allylic alcohols (the same allylic alcohol as required by the present claim 16) of the general formula, CH_2=CR-CH_2-$(A)_n$-OH (R is Hydrogen or C_1-C_5 alkyl; A is an oxypropylene group and n is less than or equal to 2) (Col. 2, lines 32-47). Although Guo does not explicitly teach a total monomer conversion of greater than 90%, it would be reasonable for one having ordinary skill in the art to expect that obtaining a total monomer conversion of greater that 90% would be within the

experimental expertise of one having ordinary skill in the art since the Guo reference teaches a process for preparing acrylic polyols from reacting allylic alcohols (such as propoxylated allylic alcohols) and acrylic monomers, under reaction conditions which anticipate or encompass the presently claimed reaction conditions (e.g., broad reaction temperature range up to 300^0 C, type and amount of monomer used, type of initiator, etc.).

Appellants argue that that there is no suggestion or motivation to modify the Guo reference in view of the teachings of the Guo et al. reference in order to arrive at the presently claimed invention.

This argument is not convincing because the Guo et al. reference (pat. 6,127,500) was cited by the Examiner to show that the Guo invention (pat. 5,475,073) generates acrylic polyols having low molecular weights and molecular weight distributions less than 3 and to also show that the said acrylic polyol resins prepared by the Guo process (US Pat. 5,475,073) are valuable reactive intermediates for making high-performance coatings and other thermoset polymers (see Col. 1, lines 41-57 of 6,127,500 patent). Thus, one having ordinary skill in the art, in view of the Guo and Guo et al. references would have been motivated to arrive at any and all possible acrylic polyols that may be prepared by the process taught by Guo (including the copolymerization of a propoxylated allylic alcohol with a C_1 to C_{20} alkyl or methacrylate monomer such as ethyl acrylate, butyl acrylate, butyl methacrylate and the like) because such acrylic polyols are recognized in the art as valuable intermediates for making high-performance coatings and other thermoset polymers.

Appellants argue that the combined teachings of the applied references do not provide a reasonable expectation of success such as achieving a monomer conversion greater than 90%.

This argument is not persuasive because the Guo reference, alone, teaches a process for preparing acrylic polyols from reacting allyl alcohols or propoxylated allylic alcohols with acrylic monomers, under reaction conditions which anticipate or encompass the presently claimed reaction conditions (e.g., broad reaction temperature range up to 300^0 C, type and amount of monomer used, type of initiator, etc.). Therefore, it would not be unreasonable for one having ordinary skill in the art to expect, upon optimization of the process conditions taught by Guo, that the optimum monomer conversion would be realized.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Elvis O. Price

December 19, 2005

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